

IN THE CLAIMS:

Please AMEND the claims and ADD new claims as follows:

1. (CURRENTLY AMENDED) A method of providing a multi-wavelength light source, comprising: ~~the steps of~~
modulating an optical pulse source so as to output optical pulses with a designated repetition frequency f_0 ;
time-division multiplexing the optical pulses output by said optical pulse source by
branching the optical pulses output by said optical pulse source to N paths and multiplexing the branched optical pulses so as to output optical pulses with a repetition frequency which is an integral multiple of said designated repetition frequency f_0 , wherein a time difference among the respective paths is $1/(N \cdot f_0)$; and
demultiplexing wavelengths of the optical pulses with the repetition frequency which is the integral multiple of said designated repetition frequency so as to output said wavelengths as the multi-wavelength light source.

2. (CURRENTLY AMENDED) An apparatus for providing a multi-wavelength light source, comprising:
an optical pulse source which is modulated so as to output optical pulses with a designated repetition frequency f_0 ;
a time-division multiplexing unit which ~~time-division multiplexes~~ branches the optical pulses output by said optical pulse source to N paths and multiplexes the branched optical pulses so as to output optical pulses with a repetition frequency which is an integral multiple of said designated repetition frequency f_0 , wherein a time difference among the respective paths is $1/(N \cdot f_0)$; and
a wavelength demultiplexing unit which demultiplexes wavelengths of the optical pulses with the repetition frequency which is the integral multiple of said designated repetition frequency so as to output said wavelengths as the multi-wavelength light source.

3. (ORIGINAL) The apparatus for providing a multi-wavelength light source as claimed in claim 2, wherein said time-division multiplexing unit is a Mach-Zehnder-interferometer-type time-division multiplexing apparatus.

4. (ORIGINAL) The apparatus for providing a multi-wavelength light source as

claimed in claim 2, wherein said time-division multiplexing unit is a Michelson-interferometer-type time-division multiplexing apparatus.

5. (ORIGINAL) The apparatus for providing a multi-wavelength light source as claimed in claim 2, wherein said time-division multiplexing unit time-division multiplexes said optical pulses using a plurality of optical waveguides with different optical path lengths which are arranged in a planar lightwave circuit.

6. (CURRENTLY AMENDED) The apparatus for providing a multi-wavelength light source as claimed in ~~claim 2~~ claim 5, wherein said wavelength demultiplexing unit is a wavelength demultiplexer having a multi-peak structure with a center transmission frequency spacing which is the integral multiple of said designated repetition frequency.

7. (ORIGINAL) The apparatus for providing a multi-wavelength light source as claimed in claim 6, wherein said wavelength demultiplexer is an arrayed waveguide grating filter.

8. (ORIGINAL) The apparatus for providing a multi-wavelength light source as claimed in claim 7, wherein said planar lightwave circuit and said arrayed waveguide grating filter are provided on one board.

9. (ORIGINAL) The apparatus for providing a multi-wavelength light source as claimed in claim 2, further comprising a spectrum-broadening unit which broadens spectrum of the optical pulses which are received at said time-division multiplexing unit, said spreading effected by a non-linear medium having a third-order non-linear effect.

10. (NEW) A method comprising:
branching optical pulses with a designated repetition frequency f_0 to N paths;
multiplexing the branched optical pulses so as produce optical pulses with a repetition frequency which is an integral multiple of the designated repetition frequency f_0 , wherein a time difference among the respective paths is $1/(N \cdot (f_0))$;
demultiplexing wavelengths of the produced optical pulses; and
outputting the demultiplexed wavelengths as a multi-wavelength light source.

11. (NEW) An apparatus comprising:

means for branching optical pulses with a designated repetition frequency f_0 to N paths;
means for multiplexing the branched optical pulses so as produce optical pulses with a repetition frequency which is an integral multiple of the designated repetition frequency f_0 ,
wherein a time difference among the respective paths is $1/(N \cdot f_0)$;
means for demultiplexing wavelengths of the produced optical pulses; and
means for outputting the demultiplexed wavelengths as a multi-wavelength light source.